Calculated Baltic Sea biogeochemical parameters for the period 1958-2010.

1.) General description of the data set:

In the present material the model version PROBE-Baltic 3.0 1958-2010 has been used where the inorganic carbon dynamics follow Edman and Omstedt (2011) and the biological modelling follow Gustafsson (2011). A guide to the physical-biogeochemical modelling is given in Omstedt (2011).

2.) Created:

2012-01-15

3.) Last update:

2012-01-15

4.) Keywords:

Forcing data for Baltic Sea biogeochemical modelling

5.) Area:
Baltic Sea-Kattegat region

6.) Spatial extension:

13 sub-basins

7.) Spatial resolution:

13 sub-basins

8.) Time window:
1958-2010

9.) Temporal resolution:
3 hours, daily and monthly

10.) Data and arrays:
3.1 Calculated daily time series including temperatures, salinities, oxygen and nutrients
Time series of surface and bottom temperatures (Ts, Tb), surface and bottom salinities (Ss, Sb), surface and bottom oxygen concentrations (ml/l), surface and bottom PO_4 concentrations (µmol/kg), surface and bottom NO_3 concentrations (µmol/kg), surface and bottom NHT (the sum of ammonia and ammonium concentrations, µmol/kg) , see Table 1.The time resolution is one day. The surface properties refer to values at 1 m below the surface. The deep properties refer to values 1 m above model depth. These files are put into a map under the name **PB calculated ocean time series I 1958-2010.zip** and have the size of 8.05 Mbite as zip file.

Table 1. Calculated data available in file **PB calculated ocean time series I 1958-2010.zip**

Sub-basin	Acronym	Model depth	Variables	File name
Kattegat	ka	100	$T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d$	ka_graph.dat
Öresund	or	30	$T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d$	or_graph.dat
Belt Sea	be	40	$T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d$	be_graph.dat

Arkona Basin	ar	50	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	ar_graph.dat
Bornholm Basin	bh	90	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	bh_graph.dat
E Gotland Basin	go	250	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	go_graph.dat
NW Gotland B.	nw	250	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	nw_graph.dat
Gulf of Riga	gr	50	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	gr_graph.dat
Gulf of Finland	gf	120	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	gf_graph.dat
Archipelago Sea	as	90	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	as_graph.dat
Åland Sea	al	220	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	al_graph.dat
Bothnian Sea	bs	155	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	bs_graph.dat
Bothnian Bay	bb	130	T_s,T_b,S_s,S_b,O_{2s},O_{2b},PO_{4s},PO_{4d}, NO_{3s}, NO_{3d}, NHT_s ,NHT_d	bb_graph.dat

3.2 Calculated 3 hours surface temperature, surface wind speed and fluxes

Time series of calculated ice thickness, ice concentration, concentrations for three types of plankton (µmol/kg), total alkalinity in surface and deep waters(µmol/kg), total inorganic carbon in surface and deep waters(µmol/kg), partial pressure in surface water and in atmosphere (µatm), pH in surface and deep water, flux of CO_2 between water surface and atmosphere are available as another set of files, see Table 2. The time resolution is 3 hours.

Table 2. Calculated data available in file **PB calculated ocean time series II 1958-2010.zip**

Sub-basin	Acronym	Model depth	Variables	File name
Kattegat	ka	100	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	ka_graph.dat
Öresund	or	30	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	or_graph.dat
Belt Sea	be	40	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	be_graph.dat
Arkona Basin	ar	50	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	ar_graph.dat
Bornholm Basin	bh	90	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	bh_graph.dat
E Gotland Basin	go	250	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	go_graph.dat
NW Gotland B.	nw	250	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	nw_graph.dat
Gulf of Riga	gr	50	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	gr_graph.dat
Gulf of Finland	gf	120	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	gf_graph.dat
Archipelago Sea	as	90	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	as_graph.dat
Åland Sea	al	220	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	al_graph.dat
Bothnian Sea	bs	155	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	bs_graph.dat
Bothnian Bay	bb	130	H_i, A_i, P_{1s}, P_{2s}, P_{3s}, Zo_s, A_{Ts}, A_{Tb}, C_{Ts}, C_{Tb}, pCO_{2w}, pCO_{2a}, pH_s, pH_b, F_{CO2}	bb_graph.dat

These files are put into a map under the name **PB calculated ocean time series II 1958-2010.zip** and have the size of 9.38 Mbite as zip file.

11.) Reference to other data sets:

12.) Data quality (degree of validation):

Edman, M. and A., Omstedt (2011) Modeling the dissolved *CO₂* system in the redox environment of the Baltic Sea. In manuscript.

Gustafsson, E. (2011) Modelled long-term development of hypoxic area and nutrient pools in the Baltic Proper. J. Mar. Syst., doi:10.1016/j.jmarsys.2011.11.012.

Omstedt, A., (2011). Guide to process based modelling of lakes and coastal seas. Springer-Praxis books in Geophysical Sciences, DOI 10.1007/978-3-642-17728-6. Springer-Verlag Berlin Heidelberg.

13.) Where to find the data?

Through contact person

14.) Contact person:

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